favourably; more frosty weather having prevailed the water freezes behind the boats of the men trying to open a channel in the ice-barrier. Immense disasters are anticipated from the thaw if some means are not found to work more effectually. It is stated that the block was formed principally in consequence of the situation of the bridge of Saumur, which some competent engineers proposed to demolish many years ago as creating a danger on the occasion of inundations. The proposal was renewed during the present crisis without having met with any success.

THE Canal Saint Martin, which is used so largely for provisions of Paris, has also been entirely frozen, and the blocks of ice not having melted, as in the Seine, the Director of the City Works is busy in disencumbering it as much as possible. The difficulty is not so much in cutting the ice as in sending it into the Seine by the flood gates. Although having a length of only a few kilometres, the Canal St. Martin has so many locks, that the problem of freeing it is one of the most difficult than can be imagined.

THIS week the Commission of the Municipal Council of Paris will deliberate upon the desirability of continuing the experiments on electric lighting in the Avenue de l'Opéra. Since the article by M. de Fonvielle was written, the Siemens brothers have exhibited their lamps on one of the largest confectionery shops on the Boulevard Montmartre. It works very well, and creates some sensation in Paris.

AT the last meeting of the St. Petersburg Gardening Society, Prof. Beketoff made an interesting communication on the discovery in the government of Ekaterinoslav, in a wild state, of vine-plants and of the Hungarian oak (*Quercus cervis*). Both are probably degraded plants, affording remarkable specimens of natural transformism.

AMONG the numerous bibliographical indexes which have lately appeared in Russia, we notice the "Bibliography of works in Finance, Industry, and Trade in Russia, from 1714 to 1870," by M. Karataeff, which contains a complete systematic list of more than 6,000 books, papers, and newspaper notices on these subjects. The work has just appeared at St. Petersburg.

WE notice in the last number of the *Journal* of the Russian Chemical and Physical Society, the sixth part of the memoir by Prof. Menshutkin, on the influence of isomerism of acids on the formation of compound ethers. As seen from numerous measurements published by the author, the isomerism of acids is of great influence on the absolute and relative rate of etherisation, the primary acids being etherised in from 72 to 120 hours, whilst no less than 336 hours are necessary for the complete etherisation of several tertiary acids. Besides the rate of etherisation decreases also with the increase of the molecular weight. The same journal contains a paper by MM. Beilstein, and Courbatoff on chloranilines and chlornitranilines, and the minutes of the meetings of the Society.

THE new French cable for America has been placed at the disposal of the public for correspondence. It goes direct from Brest to St. Pierre, and from St. Pierre to Massachusetts, where it is connected with the American Telegraphic Union. A new cable will be laid from Brest to Penzance by the *Faraday* steamer, in the beginning of February, and afterwards from Penzance to St. Pierre. This second cable will be used for English telegrams.

IT is stated that a valuable bed of anthracite has been prospected at Ching-mên-chow, near Ichang on the Upper Yangtsz-kiang, and that it is already being worked. The coal district is said to extend for seventy-five square miles, and to contain ten beds of coal, one of which, at Wo-tsze-kow, is estimated to contain 1,200,000 tons, and lying only 100 feet below the surface.

THE Cracow newspaper *Wiek* states that the Cracow Academy proposes to convoke a general congress of historians.

THE Forty-sixth Annual Report of the York School Natural History Society is on the whole favourable; good work has been done in the geological section especially.

THE annual meeting of the Yorkshire Naturalists' Union was held at Huddersfield on Saturday week, Dr. H. C. Sorby, the president, occupying the chair. There are now twenty-six societies in the Union; Prof. Williamson, of Manchester, was chosen as Dr. Sorby's successor in the presidency. The latter gave his annual address in the evening on "The Structure and Origin of Limestones."

WE have received a report of a very successful scientific exhibition which has been opened for a few days by the enterprising Dundee Naturalists' Society. We notice from the programme of the Society, that besides lectures by eminent men of science, a number of papers of a thoroughly scientific character, will be read by members of the society during the present session.

A BANK, commonly called Hafner, in the Lake of Zurich, and situated at a distance of a few thousand feet from the Mansion House Promenade, is now being minutely investigated by order of the town authorities. It appears that remains of a prehistoric pile dwelling are coming to light at this spot, consisting of a quantity of coarse and fine clay vessels, coals, a few bronze implements, &c. The piles upon which the old colony rested are particularly numerous.

THE additions to the Zoological Society's Gardens during the past week include a Chinese Rhesus Monkey (*Macacus lasiotus*) from Shanghai, presented by Messrs. John Morris and A. H. Brown; two Blue-eyed Cockatoos (*Cacatua opthalmica*) from the Duke of York's Island, presented by the Rev. Geo. Brown, C.M.Z.S.; two Martinican Doves (*Zenaida martinicana*) from Grenada, W.I., presented by Capt. H. King; a Kittiwake Gull (*Rissa tridactyla*), European, presented by Mr. W. H. Cope, F.Z.S.; a Common Barn Owl (*Strix flammea*), European, presented by Mr. G. D. Edwards; a Jaguar (*Felis onça*) from South America, four Common Peafowls (*Pavo cristata*) from India, two Knots (*Tringa canutus*), four Widgeon (*Mareca penelope*), a Wild Duck (*Anas boschas*), two Scaup Ducks (*Fuligula marila*), European, purchased.

OUR ASTRONOMICAL COLUMN

PERIODICAL VARIATION IN THE BRIGHTNESS OF NEBULÆ.—In 1877, in a communication to the Royal Astronomical Society, Prof. Winnecke drew attention to the nebula H. II. 278, remarking that it appeared to exhibit not only a variability in its light, but, which he considered much more remarkable and difficult of explanation, that *periodical* fluctuations of brightness seemed to take place. A short time since he briefly pointed out a second case of similar character, in the nebula *H. I. 20*; in the last number of the *Astronomische Nachrichten* he returns to the subject, and collecting the descriptions of the latter nebula, presents very strong evidence of the variability of its light and indications that it may prove periodical.

H. I. 20 is No. 882 *h*, and No. 2405 of the General Catalogue: its position for 1880 is in R.A. 11h. 18m. 13s., N.P.D. 77° 59′·6, or it precedes B.A.C. 3882 by 34ˢ·5s., and is 5′ south of the star. A star 12m. follows at 2ˢ·8s., 2″·1 to the north. Sir W. Herschel described it as "very bright" on March 15, 1785. Forty-five years afterwards his son found it "extremely faint," and remarked at the time: "This nebula must have changed greatly, if it ever belonged really to the 1st class." On April 4, 1831, he again found it faint. The next record of its appearance was made by Boguslawski, during his preparation of Hour XI. of the Star-charts of the Berlin Academy, when it appears,

to have been bright enough to be well seen in the comparatively small telescope used in the formation of the chart (aperture 3·8 inches); this would be at the epoch 1840 ±. On March 7, 1856, Winnecke found it pretty bright with the Berlin refractor. D'Arrest, on February 19, 1863, noted a considerable diminution of brightness: "Hodie aperte non supra tertiam classem," and he adds: "Locum hæc nebula non mutat, an lucem?" On April 10, 1878, it had again brightened, Winnecke recording: "Bei hellem Mond, deutlich gesehen, gewiss I. Classe." On March 21, 1879, he considered it "wohl nicht I., aber gut II. Classe." This nebula is of the elongated class, the direction of elongation not very far from the parallel; the longest diameter about 1½′. It is evidently well deserving of continuous observation.

Prof. Julius Schmidt directed attention in 1862 to another very suspicious case in the same quarter of the heavens. The object to which he refers in his communication to the *Astronomische Nachrichten* appears to be H. IV. 4, though he does not mention the identity. Sir W. Herschel, observing on February 22, 1874, describes it as "extremely faint, small, like a star with a very faint brush s.p.; 240 shows the star." It will be remembered that Sir W. Herschel's fourth class included "stars with burs, with milky chevelure, with short rays, remarkable shapes, &c." Sir John Herschel's description on April 13, 1828, does not differ from his father's; he calls it a "star 13·14 m., with a faint, small, nebulous brush." In the General Catalogue, where it is No. 2403, it is noted "very faint, small; attached to a star 13 m." Prof. Schmidt commences his note upon the probable variability of this object by remarking that it is found upon Chart No. 6 of the Bonn Durchmusterung, and must have been seen in the zone-telescope, a Fraunhofer comet-seeker of three inches aperture and two feet focus; it is No. 2436 at p. 24 in vol. iii. of the Bonn Observations. At the date of his communication (1862, March 29) he says: "This nebula is at the limit of visibility for the Athens refractor." He determined the position of the nebula and of two small neighbouring stars by reference to Weisse No. 315, with the following results for 1855·0:—

	h. m. s.	° ′ ″	
Nebula R.A.	11 16 22·6...Decl.	−0 18 36	Light of nucleus = 13 m.
x ...	11 16 28·1... ,,	−0 21 59...	12·13
y ...	11 16 42·5... ,,	−0 20 34...	11·12

The Bonn position reduced to the same epoch gives R.A. 11h. 16m. 28·8s., Decl. −0° 21′·8, agreeing almost precisely with Schmidt's small star *x*. There may be a suspicion, therefore, that the place of greatest condensation of the nebulosity changes, as would appear to be the case with the first variable nebula in Taurus, discovered by Mr. Hind in 1852, according to M. Otto Struve's observations at Pulkowa. These objects require, and certainly merit, very close observation with adequate instruments.

TOTAL SOLAR ECLIPSES IN THE NEXT DECADE.—The report of the observation of an intra-Mercurial planet, during the total eclipse of the sun on the 11th inst., from one of the higher mountains in California (which, however, at the time we write, has not received the confirmation that might have been expected), naturally directs attention to the similar opportunities for observation of such a body that are approaching, and we may briefly particularise the circumstances under which the total eclipses of the sun, within the next ten years, will take place. The first is the eclipse of 1882, May 17, where the central line passes over Egypt, not far from Luxor, near Teheran, and so across Asia to Shanghai; the greatest duration of totality is 1m. 48s., but at the most accessible stations will not exceed 1m. 15s.; maps exhibiting the general features of this eclipse are already published in the *Nautical Almanac* and the *American Ephemeris*. Then follows the eclipse of 1883, May 6, in which the course of the central line is wholly on the Pacific Ocean, avoiding apparently, with the exception of the Marquesas, the inhabited islands. From the Admiralty chart of this group, it seems that the total phase may be observable at Chanel Island, where it will commence about 0h. 42m. local time, continuing 2m. 52s. The eclipse of 1885, September 9, may be well observed in New Zealand, where the sun will have risen to an altitude of fifteen or sixteen degrees, the duration of totality on the central line in the longitude of Wellington being 1m. 54s. Next follows the great eclipse of 1886, August 29, a recurrence of that of 1868, August 17, which was observed in India. Unfortunately in this case we have again an ocean track for the belt of totality, except near the beginning and ending of its course; at the southern extremity of the Island of Grenada the sun will be hidden for 3m. 15s., while at an altitude of about 20°; but in about 14° 13′ west of Greenwich, and latitude 2° 58′ N., where the sun is centrally eclipsed on the meridian, totality will continue for nearly 6m. 30s., and it may be expected that efforts will be made to secure in this part of the Atlantic, at least such observations as bear upon the existence of an intra-Mercurial planet or planets; when the central line reaches the African coast the duration of total phase will have diminished to about 4m. 45s., in 12° S. latitude. The next eclipse is that of 1887, August 19, which it was supposed for a long time would be total in this country, the central line, however, does not reach England; commencing in Central Germany, or in 11° 39′ east of Greenwich, and 51° 38′ N., it passes by Berlin and Moscow, to a point in 102° 15′ E., and 53° 46′ N., where the sun will be totally eclipsed on the meridian, and thence to 173° 47′ E. and 24° 32′ N., where the central phase passes off the earth; at Berlin, where the sun will only just be clear of the eastern horizon, totality continues 1m. 41s., and in the longitude of Moscow, to the north of the city, 2m. 30s., with the sun at an altitude of 17°; on the shores of Lake Baikal, where he will be near the meridian, the duration of totality is increased to 3m. 38s. The last total eclipse of the decade to which this note applies will take place on December 22, 1889; it may be observed at Bridgetown, Barbadoes, where the sun at an altitude of about 6° will be hidden for 1m. 48s.; at a point on the Angola coast in about 10° S., totality will continue 3m. 34s., the central eclipse passes off the earth in 60° 55′ E. and 6° 53′ N.

BIOLOGICAL NOTES

BEES EATING ENTRAPPED MOTHS.—Mr. Packard, jun., writing in the January number of the *American Naturalist*, says that a flowering stalk of an asclepiad (*Physianthus* [*Aranja*] *albens*) was brought to him last September, with the bodies of several moths (*Plusia precationis*) hanging dead from the flowers, being caught by their tongues or maxillæ. "The e moths had, in endeavouring to reach the pollen-pockets of the flowers, been caught as if in a vice by one of the opposing edges of the five sets of hard, horny contrivances covering the pollinia." A very short time afterwards the Rev. L. Thompson, of North Woburn, Mass., a careful observer, sent Mr. Packard the following details of the behaviour of bees (*Apis mellifica*) also frequenting the flowers of the same asclepiad:—"My attention was attracted by two or three bees buzzing immediately around as many entrapped moths that were alive and struggling to get away. Every moment or two a bee suddenly and furiously darted upon a prisoner and seemed to me to sting it, despite its desperate efforts to escape. This onset was generally instantaneous, but was repeated again and again; and after a moth became still and apparently lifeless the bee settled upon and, if my eyes did not greatly deceive me, began to devour it." Mr. Thompson previously noticed tongues of the same species of moth caught in the flowers, the bodies to which they belonged having disappeared. At the time he fancied these were probably eaten by birds, but on further examination he came to the conclusion that the bees had really feasted on animal food, as well as upon the nectar of the surrounding flowers. Specimens of these bees being captured, the species was determined by Mr. Packard. On this fact being communicated to Mr. Darwin, he wrote that he "never heard of bees being in any way carnivorous, and the fact is to me incredible. Is it possible that the bees opened the bodies of the Plusia to suck the nectar contained in their stomachs? Such a degree of reason would require confirmation, and would be very wonderful." Hermann Müller wrote "that his brother Fritz in South Brazil has observed that honey-bees (species doubtful) licked eagerly the juice dropping from pieces of meat which had been suspended in the open air to dry; but he thinks nothing has been published on the carnivorous habits of bees." The well-known apiarian, Prof. A. J. Cook, however, reminds Mr. Packard "that honey-bee workers within the hive, on killing off the drones, tear them in pieces with their mandibles rather than sting them, and that he has seen them thus kill a humble-bee that had entered the hive." Huber, if we mistake not, also tells us that under certain circumstances the common hive-bee will devour the eggs laid by the queen bee.

NEW MOSASAUROID REPTILES.—The Mosasauroid Reptiles are so rare in Europe that the famous type specimen described